Chapter 12

DNA Technology and Genomics

Introduction Explain how DNA evidence was first used to solve two horrible crimes.

Bacterial Plasmids and Gene Cloning

12.1 Explain how plasmids are used in gene cloning.

12.2 Explain how restriction enzymes are used to “cut and paste” DNA into plasmids.

12.3 Describe the process used to produce many copies of a desired human gene.

12.6 Explain why different organisms are used to mass produce proteins.

Restriction Fragment Analysis and DNA Fingerprinting

12.10 Explain how gel electrophoresis is used to sort DNA and proteins.

12.11 Explain how restriction fragment analysis is used to detect differences in DNA sequences.

12.12 Explain how DNA fingerprinting is used to make identifications and answer questions about family relationships.

12.13 Describe the recent efforts and potential of human gene therapy. Discuss the ethical issues that these techniques present.

Genomics

12.18 Explain how genetically modified organisms are transforming agriculture.